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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,566	06/28/2001	Masato Imai	09793822-0149	5465

7590 10/08/2002  
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EXAMINER

NGUYEN, HOAN C

ART UNIT PAPER NUMBER

2871

DATE MAILED: 10/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/894,566

Applicant(s)

IMAI ET AL.

Examiner

HOAN C. NGUYEN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 8-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 8 and 10 are rejected because:

- a. Limitation "said axis" (what axis?) is lack antecedent basis.
- b. Examiner fails to understand the differences between "exploiting optical rotating characteristics" and "exploiting birefringence" since the "optical rotating characteristic" causes the change in "birefringence". Besides, applicant fails to address "rotating characteristics" of what.
- c. Applicant fails to address the relationships between "the axially symmetrical orientation of said liquid crystals is distorted along said axis" and "optical rotating characteristics" in claim 8, and between "the axially symmetrical orientation of said liquid crystals is not distorted along said axis" and "birefringence" in claim 10.

Claim 9 is rejected since it depends on infinite claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1- 3, 6, 8 and 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Tokuo (JP2000075295).

Tokuo teaches (Figs. 17-18) a liquid crystal display device comprising:

- a pair of substrates 100/110 arranged facing each other with a pre-set gap in-between;
- liquid crystals 121 held in said gap;
- means for driving a cell (abstract) with applying an electrical field to said liquid crystals to change the state of orientation thereof;
- a wall structure 112L formed in each of small-sized areas obtained on sub-division along at least one substrate for orienting the liquid crystals lying in each small-sized area axially symmetrically on application of said electrical field;
- a groove structure 115L/R formed in each of said small-sized areas and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure.

wherein

- said wall structure is formed for encircling a rectangular area and said groove structure is formed for extending along diagonal lines of said rectangular area according to claim 2;
- the liquid crystals in each small-sized area are divided into four groups and are oriented symmetrically with respect to an axis perpendicular to a point of intersection of said two diagonals lines according to claim 3;
- liquid crystals are of negative dielectric constant anisotropy and the surfaces of said two substrates are processed for orientation for orienting said liquid crystals perpendicularly in the absence of applied voltage (col. 10 lines 40-49) according to claim 6.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokuo (JP2000075295).

Tokuo teaches (Fig. 7) a LCD wherein said one substrate includes an electrode as means for applying an electronic field to said one substrate; and wherein said groove structure 115R/L is formed in the orientation film 140 formed in said electrode 111 itself.

Tokuo fails to disclose the groove structure is formed in an insulating layer formed in said electrode itself.

It is conventional that the orientation film is made of insulating film such as silicon oxide.

3. Claims 1, 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horie (US6226056B1) in view of Tokuo (JP2000075295).

In regard to claim 4, Horie teaches (Fig. 26, col. 1 lines 18-67) a plasma addressed liquid crystal display device, wherein said one substrate 10 is a transparent plate and a color filter layer 9, and alignment film on color filter (col. 2 line 1), a transparent electrically conductive layer (signal electrode 8 are formed on one surface thereof.

In regard to claim 11, Horie teaches (Fig. 8, col. 12 lines 30-45) a plasma addressed liquid crystal display device, wherein said means for applying the electrical field is made up of signal electrodes 8 formed in columns on one substrate 10 and discharge channels 17 formed in rows in the other substrate 4, said discharge channel being separated from said liquid crystals by a dielectric sheet 6.

However, Horie fails to disclose

- a wall structure formed in each of small-sized areas obtained on sub-division along at least one substrate for orienting the liquid crystals lying in each small-sized area axially symmetrically on application of said electrical field;

- a groove structure formed in each of said small-sized areas and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure.

wherein the groove structure being formed by patterning at least one of said color filter layer, transparent insulating layer (not alignment film as Horie disclosed) and the transparent electrically conductive layer.

Tokuo teaches (Figs. 17-18) for realizing display of broad visual field angle with reducing visual angle dependency, a liquid crystal display device comprising:

- a wall structure 112L formed in each of small-sized areas obtained on sub-division along at least one substrate for orienting the liquid crystals lying in each small-sized area axially symmetrically on application of said electrical field;
- a groove structure 115L/R formed in each of said small-sized areas and adapted for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure.

wherein the groove structure being formed by patterning at the transparent electrically conductive layer 111.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the a plasma addressed liquid crystal display device as Horie disclosed with a wall structure formed in each of small-sized areas obtained on sub-division along at least one substrate for orienting the liquid crystals lying in each small-sized area axially symmetrically on application of said electrical field; a groove structure formed in each of said small-sized areas and adapted

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for adjusting the axial symmetrical orientation of said liquid crystals in cooperation with said wall structure, wherein the groove structure being formed by patterning at least one of said color filter layer, transparent insulating layer and the transparent electrically conductive layer for realizing display of broad visual field angle with reducing visual angle dependency.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokuo (JP2000075295) as applied to claim 1 above in view of Nishiguchi (US5978064A)

Nishiguchi teaches (col. 13 lines 8-15) the liquid crystal material and the photopolymerized resin (i.e., the polymer), which results in a liquid crystal display device having excellent display qualities due to the reduction of poorly oriented liquid crystal, thereby stabilizing the state of axially symmetrical orientation produced on application of an electrical field.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the a plasma addressed liquid crystal display device as Tokuo disclosed with a photopolymerizable resin is added to said liquid crystals for excellent display qualities due to the reduction of poorly oriented liquid crystal, thereby for stabilizing the state of axially symmetrical orientation produced on application of an electrical field.

### **Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:



Yamada et al. (US6437845B1). Disclose liquid crystal display device with multi-domains with convex and concave on electrode and alignment layer.

Lien et al. (US005309264A) disclose a liquid crystal display having multi-domain cells with openings in pixel electrode.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (703) 306-0472. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, SIKES L WILLIAM can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-8178 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

HOAN C. NGUYEN  
Examiner  
Art Unit 2871

chn  
September 13, 2002

  
TOANTON  
PRIMARY EXAMINER